

# **Linking Pre- and Post-Deployment Forms and Subsequent Medical Visits**

**6th of 7 presentations for DEEP Update**

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# THE DEEP

## The Deployment Environmental Epidemiology Project

US Army Center for Health Promotion and Preventive Medicine  
Force Health Protection, Louisville, KY Aug 2005

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# Abstract

A sample of Army personnel whose records indicated deployment to Afghanistan in 2003 was obtained. From this roster, DD 2795, DD 2796 and Inpatient and Outpatient records were obtained from AMSA. These data were linked for each individual. The resultant number of individuals who had data from all three sources was much lower than the original number. Preliminary results of the analysis will be presented. Several factors including duplicate/multiple records, determination of appropriate outcome metric contribute to the challenging nature of this analysis.



## OBJECTIVE DATA

Environmental Samples

## OBJECTIVE DATA

Health Data: SIDR/SADR

**EXPOSURE**

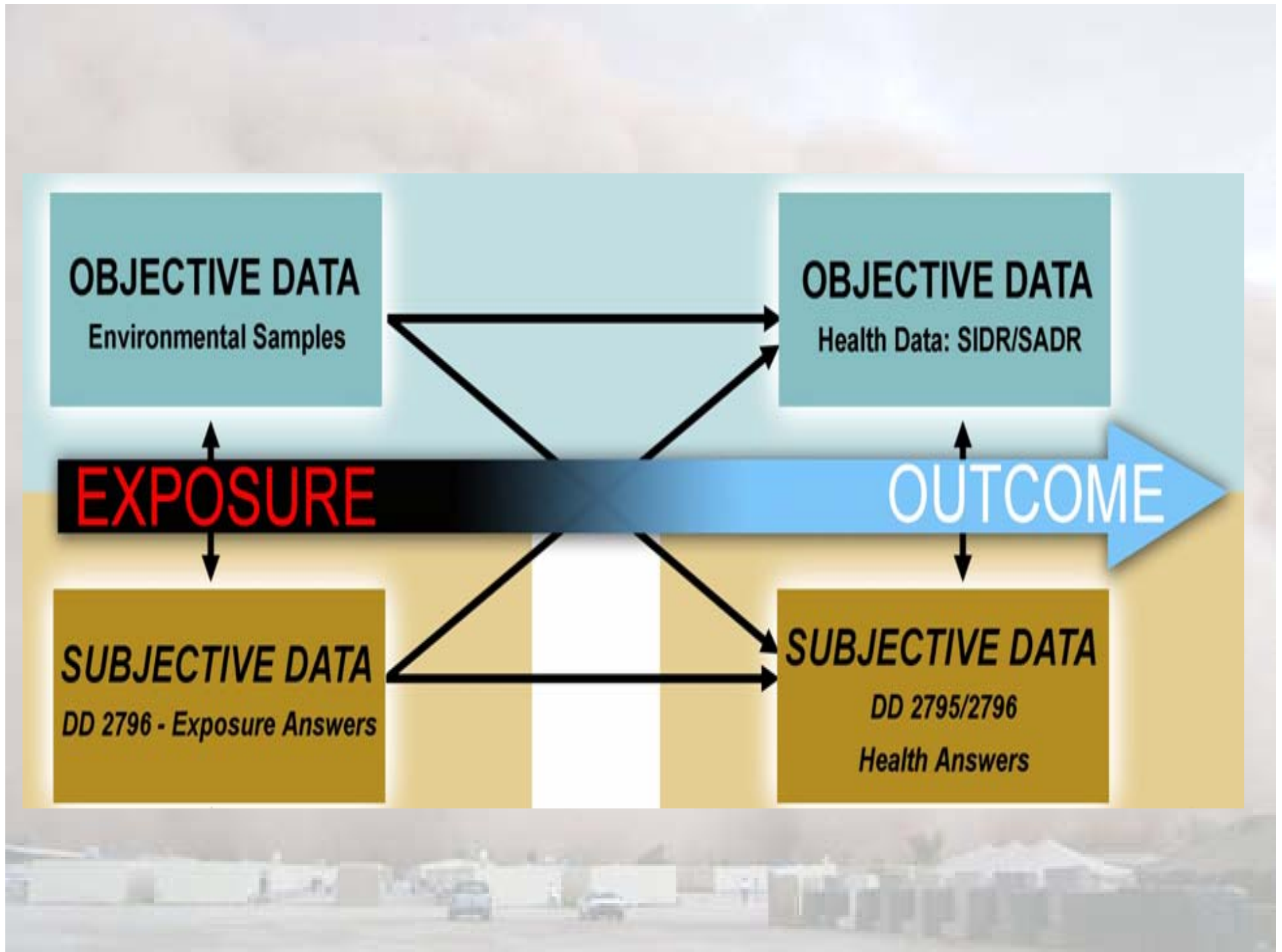
**OUTCOME**

## SUBJECTIVE DATA

DD 2796 - Exposure Answers

## SUBJECTIVE DATA

DD 2795/2796  
Health Answers

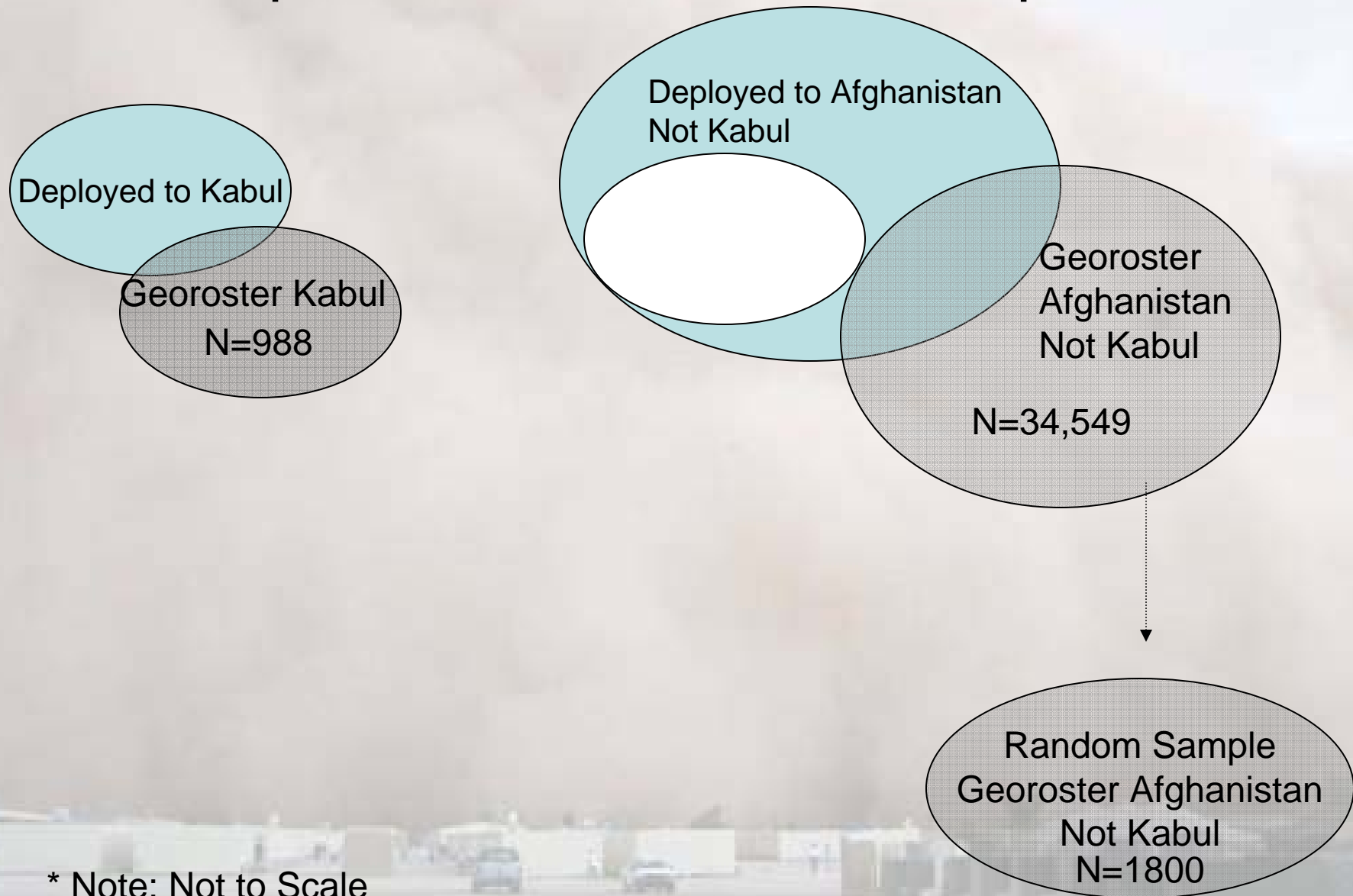




Those Deployed to Afghanistan

Deployed to Kabul

# True Populations vs Georster Populations



\* Note: Not to Scale

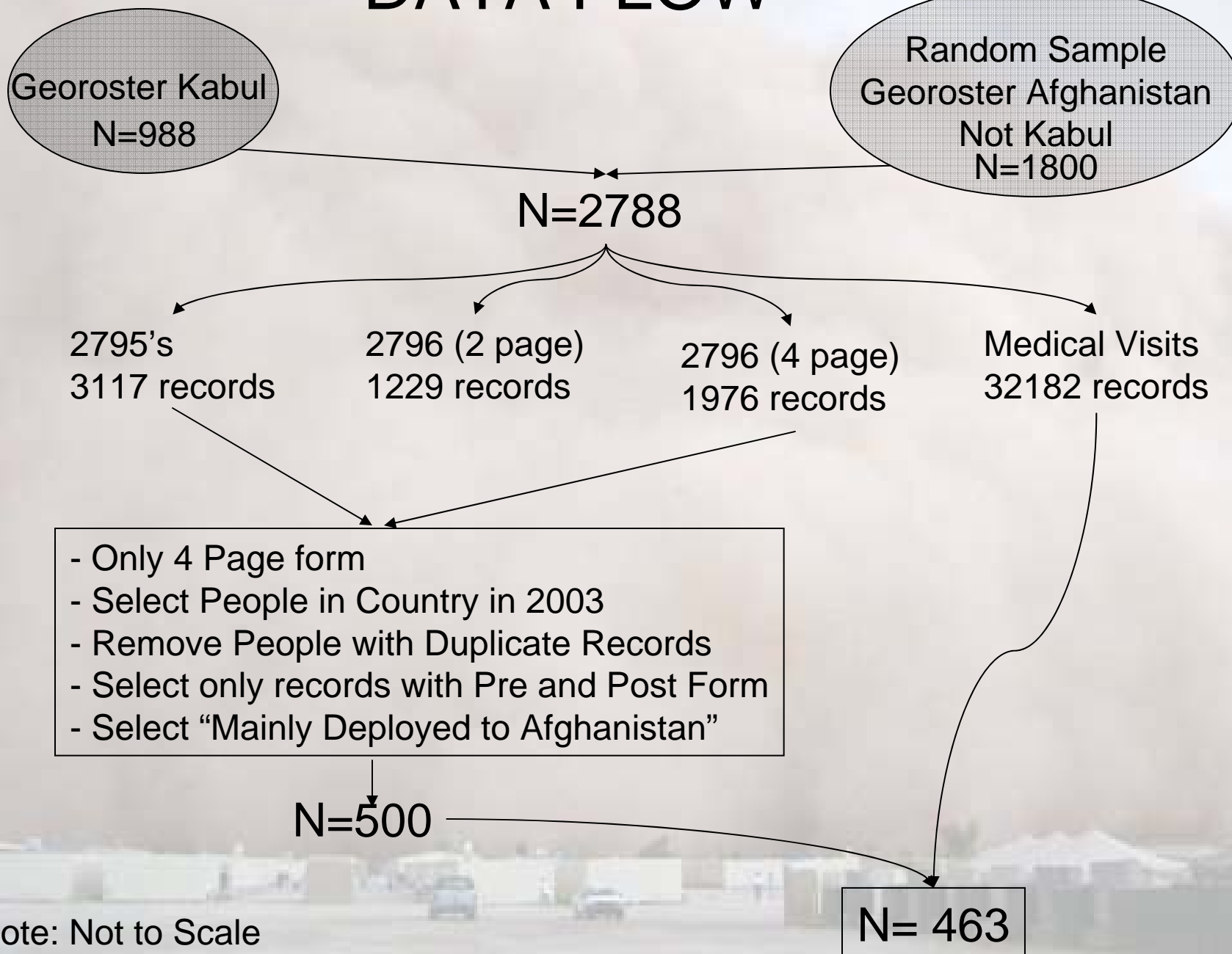
# Additional Complications

- 2 Page and 4 Page DD 2796
  - 4 page form implemented Mid 2003
  - Both forms used during 2003
- Multiple Forms
- Other Deployments





# DATA FLOW



\* Note: Not to Scale

Study Population: Georoster Defined Population of those deployed to Kabul  
and a Georoster Defined sample of those deployed to Afghanistan in 2003  
N=463

- Demographics
- Deployment
- Total Number of Medical Visits after deployment
  - Number of “Non V-Code” Visits
- Percentages of Soldiers who had a diagnosis in ICD-9  
Diagnosis Groups after deployment
- Number of Visits (Total and Non V-Code) for selected  
DD 2796 Questions
- Mental Health screening question as a predictor for  
subsequent Mental Health Diagnosis

# Who n=463

	Percentages
Gender (Female)	6.9
Age	32.1 $\pm$ 1.2 (Mean $\pm$ SD); Median 31
Race	Black: 10.6 Hispanic: 7.3 White 77.1
Marital Status (Married)	49.2
Military Grade	E1-4: 33.9 E5-9: 47.1 W1-4: 1.3 O1-3: 10.6 O4-9: 7.1

# When n=463

Date of Arrival	Earliest: Jan 02 Latest: Dec 03 Mean: 7 Feb 03 Median: 19 Jan 03
Date of Departure	Earliest: Jan 03 Latest: Aug 04 Mean: 6 Sep 03 Median: 4 Aug 03
Days in Theater	Mean: 211.0 days SD: 69.5 days
Medical Visits after departure from Theater	Jan 03 – Jun 04

# Medical Visits After Deployment

	Mean $\pm$ SD	Median	Range
# Health Care Visits After Deployment	8.6 $\pm$ 11.5	5.0	1-102
# Health Care Visits After Deployments Excluding "V Codes"	4.5 $\pm$ 9.22	2.0	0-87

## Examples of V Code Visits:

V 70.0: Routine general medical exam

V 70.5: Examination of defined subpopulation eg. Armed forces personnel

V 72.1: Examination of ears and hearing



# Percentage of Soldiers with Diagnosis\* (inpatient/outpatient visits after deployment)

Musculoskeletal System	30.9
Injury/Poisoning	24.2
Nervous System	22.7
Respiratory	13.4
Skin	11.0
Mental Disorder	9.7
Infectious/Parasitic	7.8
Digestive System	6.7
Circulatory System	5.6
Endocrine/Nutrition/Metabolic	5.4
Genitourinary	3.9
Neoplasms	3.5
Congenital Anomalies	3.5

\*Diagnosis codes grouped based on ICD-9 categories

\*\*Individual Soldiers can have multiple diagnoses

## Number of Visits (Total and Non V-Code) for selected DD 2796 Questions

- Q #1: Did your health change
- Intelligent Allocation (Dr. Zhou's method)
- HCP Q #1: Would you say your current health is
- HCP Q #4: Sought or Seeing Mental Health Care
- HCP Q #5: Exposure Concerns
- HCP Q#6: Health Concern

**Q #1: Did your health change during this deployment:  
# of Medical Visits after Departure from Country**

<b>Did your health change during this deployment?:</b>	<b>Stayed about the same or got better n= 343</b>	<b>Got Worse n= 115</b>
Mean # Medical Visits (SD)*	6.8 (8.5)	13.5 (16.4)
Median # Medical Visits	4	9
Mean # Medical Visits [no V-code visits] (SD)*	3.0 (5.9)	8.7 (14.5)
Median # of Medical Visits (no V-code visits)	1	4

\* t-test significant difference between means

Intelligent Allocation (using Dr. Zhou method):  
# of Medical Visits after Departure from Country

Did your health change?	No change or better N = 316	Got Worse N= 123
Mean # Medical Visits (SD)*	7.0 (8.9)	12.4 (16.1)
Median # Medical Visits	4	8
Mean # Medical Visits [no V-code visits] (SD) *	3.2 (6.1)	7.7 (14.2)
Median # of Medical Visits [no V-code visits]	1	3

\* t-test significant difference between means

## # of Medical Visits after Departure from Country

Would you say your current health in general is:	Excellent n= 90	Very Good n= 180	Good n= 148	Fair n= 34	Poor n= 6
Mean # Medical Visits (SD)	6.4 (6.6)	8.0 (9.4)	9.0 (13.4)	11.5 (12.4)	31.2 (33.1)
Median # Medical Visits	5	5	5	7.5	17.5
Mean # Medical Visits [no V-code visits] (SD)	2.5 (3.8)	4.0 (8.0)	4.8 (10.3)	6.9 (8.8)	24.7 (31.6)
Median # of Medical Visits [no V-code visits]	1	1	2	4	15



## Provider Administered Mental Health Question: # of Medical Visits after Departure from Country

Have you sought/will you seek mental health assistance?	No n= 438	Yes n= 20
Mean # Medical Visits (SD)*	8.0 (10.2))	16.5 (18.0)
Median # Medical Visits	5	11.5
Mean # Medical Visits [no V-code visits] (SD)*	4.0 (7.7)	11.6 (16.5)
Median # of Medical Visits [no V-code visits]	1.5	5

\* t-test significant difference between means

Provider Administered Question on Exposure Concerns:  
# of Medical Visits after Departure from Country

<b>Do you have concerns about possible exposures or events during this deployment that you feel may affect your health?</b>	<b>No Exposure Concern n= 349</b>	<b>Yes Exposure Concern n= 104</b>
Mean # Medical Visits (SD)	8.3 (10.7)	8.9 (11.0)
Median # Medical Visits	5	7
Mean # Medical Visits [no V-code visits] (SD)	4.2 (8.3)	4.7 (9.0)
Median # of Medical Visits (no V-code visits)	1	2

## Provider Administered Question on Health Concerns: # of Medical Visits after Departure from Country

<b>Do you currently have any questions or concerns about your health?</b>	<b>No Health Concern n= 352</b>	<b>Yes Health Concern n= 97</b>
Mean # Medical Visits (SD)	7.8 (9.7)	9.9 (11.5)
Median # Medical Visits	5	5
Mean # Medical Visits [no V-code visits] (SD) *	3.7 (6.6)	5.8 (10.6)
Median # of Medical Visits [no V-code visits]	1	2

\* t-test significant difference between means

## Provider Administered Mental Health Question and Mental Health Diagnosis after Deployment

	Mental Disorder Diagnosis	No Mental Disorder Diagnosis	Total
Answered YES sought/ seeking mental health care	9	11	20
Answered NOT sought/ seeking mental health care	35	403	438
Total	44	414	458

**Positive Predictive Value:** Probability a test positive is a true positive:  $9/20 = .45$

**Negative Predictive Value:** Probability a test negative is a true negative:  $403/438 = .92$

# Conclusions

- Those who indicated poor or worse health or indicated seeking or having sought mental health care subsequently had more post deployment health care visits and “non V-code” health care visits
- Those who indicated concern regarding exposures did not have more post deployment health care visits.
- 45% of those who indicated seeking or having sought mental health care were diagnosed with a mental health condition.
- 8% of those who did not indicate seeking or having sought mental health care were diagnosed with a mental health condition.



# Limitations

- Selection of study population
- Duplicate/multiple DD 2796 records
- Different contributions of post deployment time period not accounted for
- Excluded those without medical visits
- What defines an outpatient visit?
- No measure of severity of diagnosis

# Future Possibilities

- Use another study population (eg. random sample)
- Do not discard individuals with duplicate/multiple DD 2796 records
- Multivariate analysis of DD 2796 questions/indices for other outcomes
- Account for different contributions of post deployment time in order to calculate rates

# Questions?



# New "KABUL" Data (Dec 15 2004)

